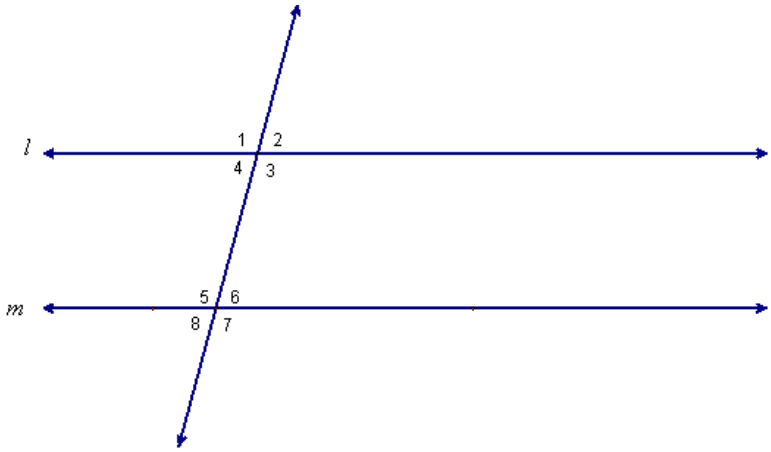
3.2 Angles and Parallel Lines

$l \parallel m$



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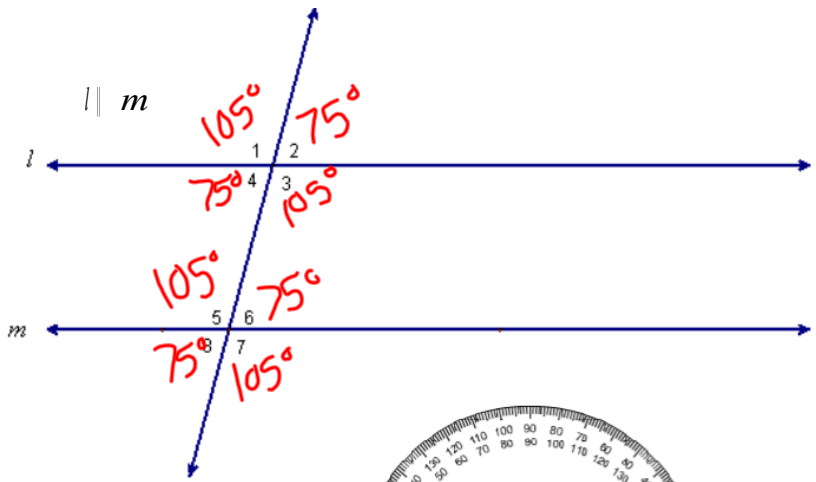
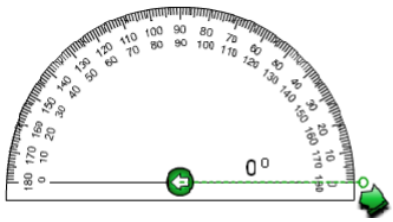
$l \parallel m$





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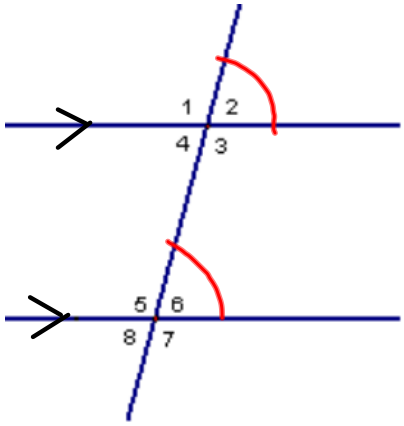
Postulate 3.1-If 2 parallel lines are cut by a transversal, then the corresponding angles are congruent.

Abbreviated: *If ||, corresponding ∠s are* ≅.

∠2 ≅ ∠6
∠1 ≅ ∠5
∠3 ≅ ∠7
∠4 ≅ ∠8



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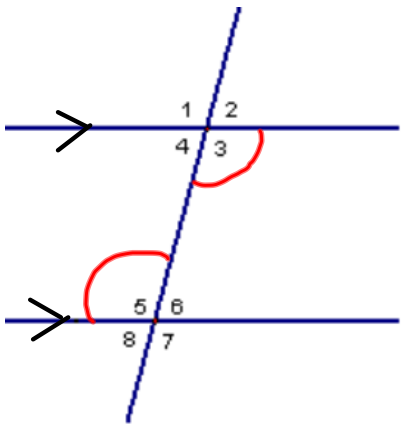
Theorem 3.1-If 2 parallel lines are cut by a transversal, then the alternate interior angles are congruent.

Abbreviated: *If ||, alternate interior ∠s are* ≅.

∠3 ≅ ∠5
∠4 ≅ ∠6



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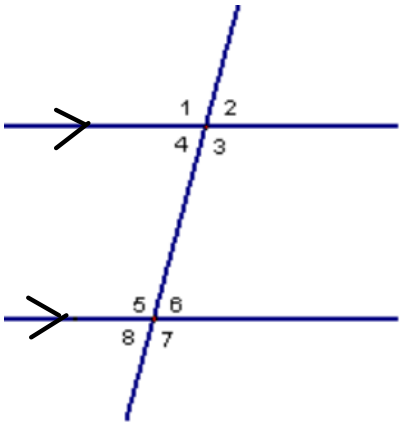
Theorem 3.2-If 2 parallel lines are cut by a transversal, then the same-side (consecutive) interior angles are supplementary.

Abbreviated: *If ||, s-side (consecutive) interior ∠s are supplementary.*

$m\angle 3 + m\angle 6 = 180$

$m\angle 4 + m\angle 5 = 180$

Let's prove this theorem.



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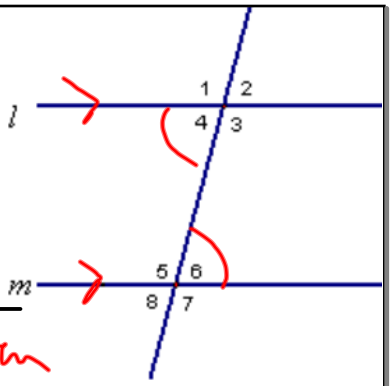
Given: l || m

Prove: ∠3 and ∠6 are supplementary



Statements	Reasons
1) $l \parallel m$	1) Given
2) $\angle 4$ & $\angle 3$ are L.P.	2) def of L.P.
3) $\angle 4$ & $\angle 3$ are suppl	3) Suppl. thm.
4) $\angle 4 \cong \angle 6$	4) If ||, alt. int $\angle$s are $\cong$
5) $m\angle 4 + m\angle 3 = 180$	5) def of suppl.
6) $m\angle 6 + m\angle 3 = 180$	6) Subst.
7) $\angle 6$ & $\angle 3$ are suppl.	7) def of suppl.

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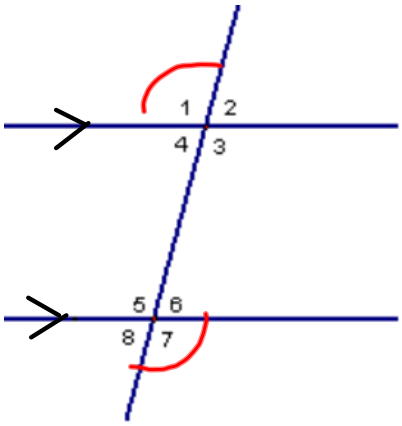
Theorem 3.3-If 2 parallel lines are cut by a transversal, then the alternate exterior angles are congruent.

Abbreviated: *If ||, alternate exterior* *∠s are* ≅.

$\angle 1 \cong \angle 7$

$\angle 2 \cong \angle 8$



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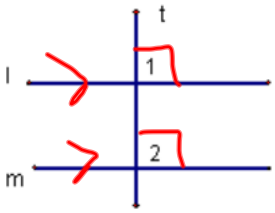
Theorem 3.4-Perpendicular Transversal Theorem-In a plane, if a line is ⊥ to one of 2 || lines, then it is ⊥ to the other line.

Given: l || m; t ⊥ l

Prove: m ⊥ t



Statements	Reasons
1. l || m; t ⊥ l	1. Given
2. ∠1 is a right ∠	2. def of ⊥
3. $m\angle 1 = 90$	3. Def. of right ∠
4. ∠1 ≅ ∠2	4. If ||, corr ∠s are ≅
5. $m\angle 2 = 90$	5. Substitution
6. ∠2 is a right ∠	6. def of rt ∠.
7. m ⊥ t	7. def of ⊥

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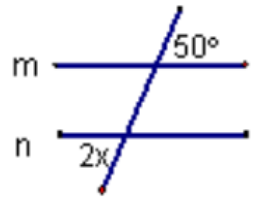
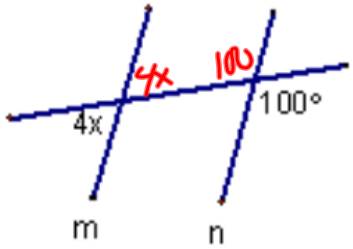
Solve for x. m||n



$2x = 50$

$x = 25$



$4x + 100 = 180$

$4x = 80$

$x = 20$

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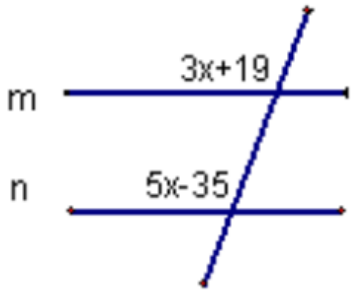
Solve for x and/or y. m||n

$7x - 44 = 180$

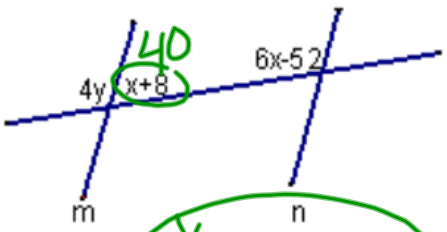
$7x =$



$3x + 19 = 5x - 35$

$54 = 2x$

$27 = x$



$x = 32$

$y = 35$

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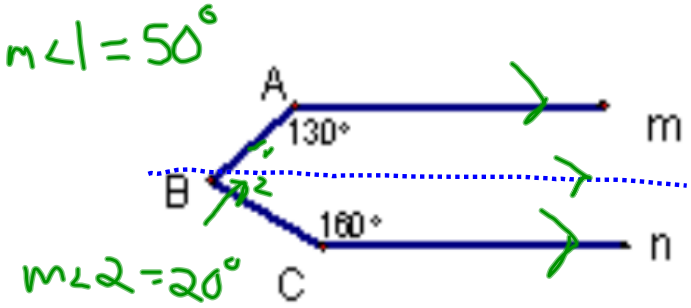
Find the measure of ∠ABC. m||n



$m\angle 1 = 50^\circ$

$m\angle 2 = 20^\circ$

$180 - 160 = 20$

$m\angle ABC = 70^\circ$

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Homework:
p. 136-137
#s 14-25, 32-36, 39

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